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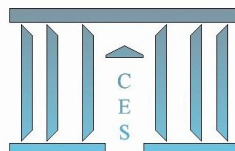
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Is the European banking system more robust? An evaluation through the lens of the ECB's Comprehensive Assessment.

Guillaume Arnould¹ and Salim Dehmej²

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Abstract

The results of the Comprehensive Assessment (CA) conducted by the ECB seem to attest the soundness of the European banking system since only 8 of 130 assessed banks still need to raise €6 billion. However it would be a mistake to conclude that non failing banks are completely healthy. Using data provided by the ECB and the EBA after the CA, we assess the capital shortfalls for each banks by considering the transitional arrangements, an implementation of Basel III sovereign debt requirements and an enhancement of the leverage ratio. In addition we show, that if the CA has been a very complex exercise, it is not the best lens through which the soundness of the eurozone banking system should be evaluated. The assumptions used for the Asset Quality Review (AQR) and the stress-tests lead to weak scenarios and requirements that undermine the reliability of the results. Finally we show that the low profitability, the massive dividend distribution and the incurred fines, give rise to concern on the ability of eurozone banks to meet the incoming capital requirements.

JEL codes: G21, G28.

Keywords: financial stability, stress tests, banking, financial regulation, Basel III.

¹ Paris I Panthéon-Sorbonne University. Labex Régulation Financière (Réfi). Email: guillaume.arnould@univ-paris1.fr (Corresponding author)

² Paris I Panthéon-Sorbonne University. Labex Régulation Financière (Réfi). Email: salim.dehmej@univ-paris1.fr

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Section 1. Introduction

On 4 November 2014, the European Central Bank became the new micro-prudential supervisor within the framework of the Single Supervisory Mechanism (SSM), the first pillar of the banking union³. A few days earlier, on 26 October, the results of a comprehensive assessment of 130 eurozone banks were published, constituting a preliminary step in the ECB's new mission. This assessment⁴ was based on an Assets Quality Review (AQR), backed-up by a stress test conducted jointly with the European Banking Authority (EBA). Stress tests are among the post-crisis regulatory framework and are used to both microprudential supervision of individual firms and macroprudential assessments of financial imbalances. The Banks' balance sheets were subjected to macro-economic scenarios, one considered as "baseline" and based on the European Commission's forecasts from early 2014, and the other as "stressed", representing worsening European economic conditions.

The exercise revealed a capital shortfall of €25 billion for 25 of the 130 assessed banks, on the basis their balance sheets at the end of 2013. Given the recapitalisation already implemented for most of these banks in 2014, in the end only 8 banks⁵ were required to raise €6 billion of capital over a period of 6 to 9 months. Failed banks had to submit recapitalisation plans and were mainly concentrated in Italy with 4 banks over 8. None of the major European banks failed the test and especially no banks from the "core" of the Eurozone (Germany, Belgium, Netherlands and France) failed either, resulting in high praise for the European universal banking model. Overall, no surprise or worrying situation was announced. Sahin and de Haan (2015) highlight that banks' stock market prices and CDS spreads did not react to the results. One should recognize however that it is a time consuming and highly complex exercise since the ECB faces a dilemma of requiring severity in order to be credible, but not to excess, in order to avoid potential destabilisation of financial markets.

Nevertheless, concluding to the soundness of European banks would be a mistake.

First, the assumptions on which the stress tests were based resulted in mild scenarios and requirements. Unlike the Fed and BoE stress tests, ECB stress test and communication about its results was restricted to the risk-weighted capital ratio, whereas the leverage ratio ("Tier 1" capital - T1, to non-weighted assets) paints a more varied picture. Our calculations of a stressed leverage ratio of 3% show a capital shortfall of €13 billion Tier1 capital, in 2015. However, if consider a 4% ratio, which will be the case in many countries (see section 3 on leverage), we find an important shortfall estimate at €88 billion Tier1 capital, in 2015.

Second, as mentioned by the ECB this exercise suffers from a problem of comparability between banks (different risk models) but also between countries (more than 150 different supervisory options and discretions applied by national regulators, such for example concerning provisions and non-performing loans). Additionally, the risk-weighted capital ratio cannot be taken literally, because its scope is evolving over the next four years during the transition to fully loaded Basel III

³ The banking union is based on three founding pillars: a single supervision, a resolution mechanism and deposit guarantee schemes. See Véron and Wolff (2013).

⁴ The comprehensive assessment was conducted not only by the ECB but also by the consultancy firm Oliver Wyman.

⁵ Of the 25 banks listed by the ECB, 12 already raised sufficient capital during 2014, and of the 13 remaining, 5 are in the process of restructuring or have implemented adequate capitalisation plans (ECB, 2014).

requirements since many elements considered until now as equity will disappear (intangible assets and deferred tax assets for example). Furthermore all countries don't keep the same pace of implementation. If we consider now the final deductions of equity, banks need €130 billion to keep the same level of capital CET1.

Third, when transposing the Basel committee recommendations into European law, the EU selected a zero risk weight coefficient for all sovereign debt securities of European Union countries while Basel regulation offered this possibility only for those considered as risk-free. An application of Basel risk weights for sovereign debt leads to a capital shortfall of €34 billion.

Finally, banks succeed generally to meet the risk weighted capital requirement by rising capital, deleveraging or rebalancing portfolios towards sovereign debt. However, if raising capital is the optimal solution for the regulator, it not the case for the bank. Furthermore, the changing environment illustrated by weak profitability, tightening regulation and even, for some banks, costly lawsuits due to misconducts, makes raising capital quite challenging.

This article continues as follows: section 2 evaluates soundness of the results of the AQR and stress tests; section 3 assess eurozone banks' capital requirements according to the regulatory evolution and section 4 discusses the eurozone banks' ability to meet those capital requirements. Section 5 concludes.

Section 2. Assessing banking system soundness through AQR and stress-tests

2.1. Size of assets as primary selection criterion

The 130⁶ banks that participated to the comprehensive assessment undertaken by the ECB were selected according to the same criteria as for the SSM (ECB, 2014), namely:

- An asset value exceeding €30 billion.
- A size exceeding 20% of national GDP, except for banks smaller than €5 billion.
- Being part of the 3 largest credit institutions in a country participating in the SSM.
- Having received European financial subsidies.

The size of the institutions is clearly the main criterion for this sample, and as emphasised by Drehmann and Tarashev (2011), a relatively large size goes hand in hand with increased complexity, denser financial links and a sufficient market share to trigger asset fire sales (AFS) in the event of financial difficulties (Arnould and Dehmej, 2013). Since 2011, the BIS has developed a scoring system for identifying systemically important banks⁷ (G-SIB). This combines 5 criteria (BCBS, 2014a): size, interconnections, substitutability, international activities and complexity. Moreover, the Federal Reserve has recently added a sixth criterion by including the reliance on short-term

⁶ The ECB comprehensive assessment included more banks than for the SSM (120), since several banks close to but below the threshold criteria and not included in the SSM were reviewed nevertheless. See part 3 and annexe 9.1 (ECB, 2014).

⁷ The Financial Stability Board (FSB) adopts the BIS methodology to identify G-SIBs, numbering 30 in 2014, of which the majority were European banks.

funding (Fed 2014a). Indeed, size is not sufficient to address the multiple systemic risk dimensions of financial institutions - as recently demonstrated by the problems of relatively small Spanish and German regional banks (respectively CajaSur in 2010 and Sachsen LB in 2007). Moreover, Switzerland has recently decided to classify the Raiffeisenbank Schweiz Genossenschaft as systemic at domestic level, to the extent that its activities are considered to be difficult to substitute in the Swiss banking system in case of bankruptcy, yet the size of its balance sheet is just €28 billion (compared for example with the €880 billion assets of UBS).

2.2. Unambitious methodological choices

As reminded by the ECB, stress tests are not used to predict future events, but to evaluate the banks' capacity to withstand deteriorating economic and financial conditions. Recent stress tests are relatively more rigorous than those performed by the Committee of European Banking Supervisors (CEBS) in 2010 and by the EBA in 2011 (a larger number of banks, more rigorous scenarios and a longer time-scale). In addition, ECB capital requirements⁸ (8% for the baseline and 5.5% for the severe case) are tougher than those of the Fed (5%) and BoE⁹ (7% for the baseline and 4.5% for the severe case). Nevertheless, they are less ambitious than those conducted in the United States since 2009 and in UK in many aspects.

The scenarios used in US stress tests are more severe (Table 1), and refer to dynamic bank balance sheets which may be adjusted during the tests in accordance with changes in the risk profiles. Systemic institutions referred to as “too big to fail”, “too costly to save” or “too complex to resolve” are distinguished from other banks and must satisfy stricter capital requirements. Finally, the assessment is not limited to the risk-weighted capital ratio but includes the stressed leverage ratio and qualitative aspects such as the pertinence of internal risk models, governance and recapitalisation plans (Fed, 2014b). If banks fail the tests they may be denied permission to distribute dividends or to repurchase shares until they are recapitalised (Hirtle and Lehnert, 2014). Finally, the UK stress test, conducted at the end of 2014, incorporated a monetary policy exit scenario by increasing the main interest rate by 4% over two years, to evaluate how banks would withstand risks stemming from increased defaulting on real estate loans¹⁰ (BoE, 2014).

⁸ CET1/RWA. See section 3 for details.

⁹ However, Fed and BoE stress tests are based also on a leverage ratio (3%).

¹⁰ Since variable rate mortgage debt is estimated at 68% of the real estate market, the latter is extremely sensitive to any rise in interest rates.

Table 1 Comparison of the severity of stress tests' scenarios

Scenario	USA, CCAR ¹¹ 2014	EU, EBA-ECB 2014 (i)	UK, BoE 2014
Real GDP	-4.75% (2014), -1% (2015), +1.5% (2016)	-0.7% (2014), -1.4% (2015), 0% (2016)	-3.5% (2015), -2.5% (2016)
Unemployment	From +4% to 11.25% mid-2015	+0.3% (2014), +0.9% (2015), +1.5% (2016)	Up to 12% (2016)
Inflation	<1% (2015), 1.5% (2016)	+1% (2014), +0.6% (2015), +0.3% (2016)	+6.5% (2015)
Stocks	-50%	-16% à -18% (ii)	-30%
Housing market	-25%	-7% à -11% (ii)	-35%

Source: Fed (2013), ESRB (2014) and BoE (2014a). (i): average for the Eurozone (ii): average of scenarios for 2014 and 2016.

The main critics addressed to the ECB exercise were about the severity of the scenarios, such as the absence of deflation or of a major shock on the sovereign debt market. It should also be noted that the transposition of macro-economic scenarios into losses for each bank was calculated through a risk assessment model specific to each institution, ultimately limiting the comparability of the level of losses between banks and the reliability of results - as the error of the British bank RBS, revealed in November 2014, reminded it. In fact, a few weeks after the announcement of the EBA results, RBS declared it had been mistaken when calculating the data communicated to the EBA: its final risk-weighted capital ratio fell consequently from 6.7% to 5.7%, just 0.2 percent above the floor of 5.5%. It is also and above all, the purely micro-prudential nature of this test which poses a problem. By definition, it excludes the systemic aspect of a shock. Second-round effects are disregarded since the banks' balance sheets are static over the exercise. Furthermore, these scenarios are non-systemic as they applied to a bank as if it was isolated from the rest of the financial sector. As such, the scenarios fail to inform macro-prudential policymakers. The 2008 financial crisis clearly illustrated the extent of contagion effects on market liquidity and during the assets fire sales.

Moreover, these stress tests barely address liability-related vulnerability, notably regarding the financing structure of banks and the liquidity of its resources (cf. the freezing of the inter-bank market following the collapse of Lehman Brothers, or the one of Northern Rock and Dexia and their difficulties in refinancing themselves on short-term markets). An assessment of liquidity ratios such as those planned in the Basel III framework (LCR¹² short-term ratios and NSFR¹³ long-term ratios), incentivising banks to make use of more stable resources would have been welcomed. Since 2012, the Federal Reserve has been conducting a confidential liquidity analysis "CLAR - Comprehensive Liquidity Analysis and Review", testing the capacity of the major banks to withstand liquidity disruption (Elliott, 2014). More generally, a review of the stability of bank funding appears

¹¹ Comprehensive Capital Analysis and Review.

¹² The "Liquidity Coverage Ratio" enters into force in 2015, and requires that over a period of 30 days bank's liquidity reserves must be higher than the leakage caused by the loss of access to short term market and the flight of deposits. See Appendix.

¹³ Work on establishing the "Net Stable Funding Ratio" will start in 2018. It stipulates that over a period of one year, the stable funding must be less than the amount of available resources. See Appendix.

necessary. The dependency on wholesale funding, (market short-term funding) in particular, has become extremely significant (IMF, 2013). This causes banks to be highly sensitive to a liquidity shock. In the UK, the Prudential Regulation Authority's (PRA's) has the supervisory role to examine liquidity and funding risks (PRA, 2015). In their stress testing banks should consider the impact of a range of severe but plausible stress scenarios on their cash flows, liquidity resources, profitability, solvency, asset encumbrance and survival horizon. An ECB's Liability Quality Review (LQR) would seem essential.

Yet the stress test conducted by the ECB is by far the most comprehensive up to now because it expands the number of banks involved. And although it is difficult to compare the capital requirements for the particularly severe US stress test, conducted in 2009 just after the crisis, with the one performed by the ECB five years later, the amounts are highly comparable with the EBA stress test of 2011, despite an increase of almost 50% in the number of banks (Table 2).

Table 2 Comparison of stress tests' results

Year	2009	2010	2011	2014	2014	2014
Stress test	USA-SCAP ¹⁴	CEBS ¹⁵ (EBA) (i)	EBA (i)	USA-CCAR	ECB-EBA (ii)	RU-BoE
Banks number	19	91	90	30	130	8
Failed banks	10 (53%)	7 (8%)	20 (22%)	3 (10%)	25 (19%)	3 (38%)
Capital shortfall in billions	\$185	€3.5	€27	n.a. (iii)	€25	n.a. (iii)

Source: Fed (2009), CEBS (2010), EBA (2011), (Fed, 2014b), ECB (2014) and BoE (2014a). (i) EU banks, (ii) banks of Eurozone and of the European Union that want to join the banking union.

2.3. Comparability issues

Non-performing loans (NPL)

The AQR conducted by the ECB in 2014 pinpointed non-performing loans (NPL henceforth) that was not accurately assessed by banks. Indeed, €136 billion of NPL must be added to the €740 billion already declared by the banks (summing to €876 billion), denoting a significant increase of almost 20%. The most affected countries are Slovenia with 32%, followed by Greece, Malta and Estonia each with a 20% reclassification of their loans (ECB, 2014).

The October 2014 AQR study marked an upward revision of NPL indicates chronic overvaluation of the quality of assets by banks. The ECB report following the stress tests (ECB, 2014) emphasises that almost a third of audited banks were more lax than the ECB in the recognition of NPL. This assessment discrepancy was found even within so-called "level 1" assets, where 13% of banks disagreed with the ECB classification. Other differences were also brought to light by the AQR related to the number of days used to assess whether a debt is considered non-performing and to the date for constituting provisions for losses. The implication of the AQR results was that the lack

¹⁴ *Supervisory Capital Assessment Program.*

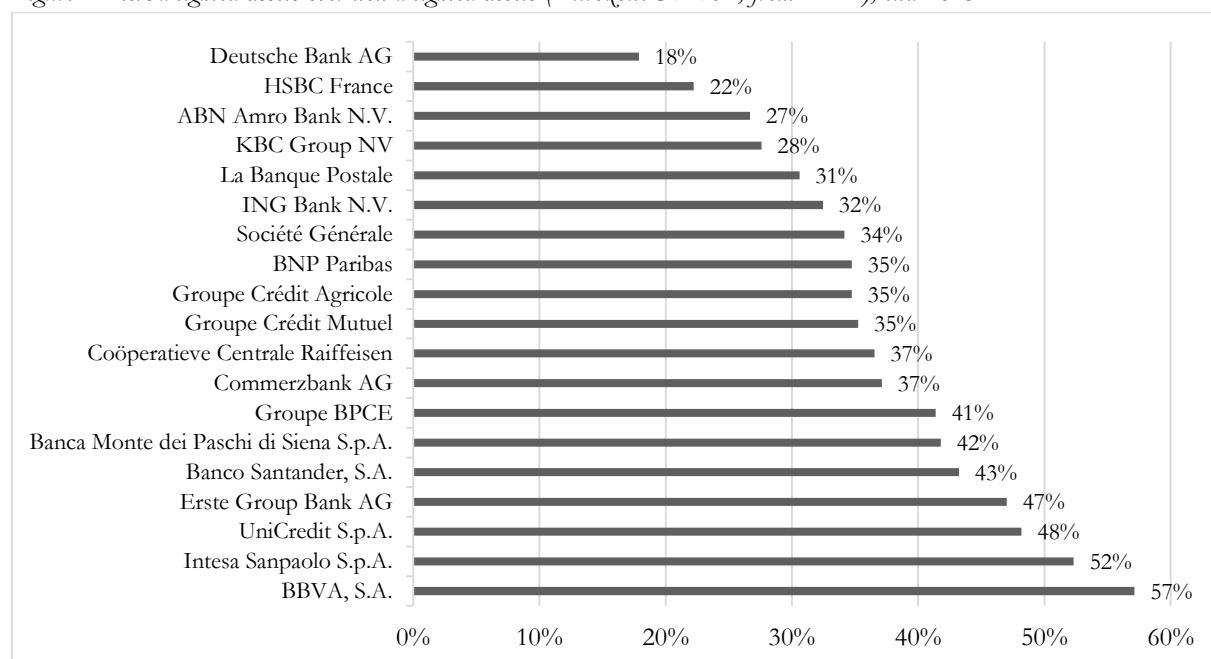
¹⁵ *Committee of European Banking Supervisors.*

of European harmonisation and possible indulgence of national supervisory bodies has hindered a rigorous assessment of risks.

Internal risk models

The statistics highlighted by the ECB during its presentation of stress tests results are related to risk-weighted capital ratio (“Common Equity Tier1” capital – CET1 to “Risk Weighted Assets” – RWA) outcomes. Contrary to the leverage ratio which does not discriminate between assets according to their degree of risk, the risk-weighted capital ratio allows, in theory, for the capital requirement to be adjusted according to the assumed risk of assets. However, the amount of weighted assets may vary significantly from the non-weighted amount (Figure 1). In the case of Deutsche Bank, for example, weighted assets account for only 18% of total assets, which substantially reduces the capital requirement. This discrepancy may be explained either by a more advantageous risk assessment methodology or by the holding of low capital-consuming assets.

Figure 1 Risk weighted assets over non-weighted assets (Eurozone SIFI's¹⁶, from EBA), end 2013

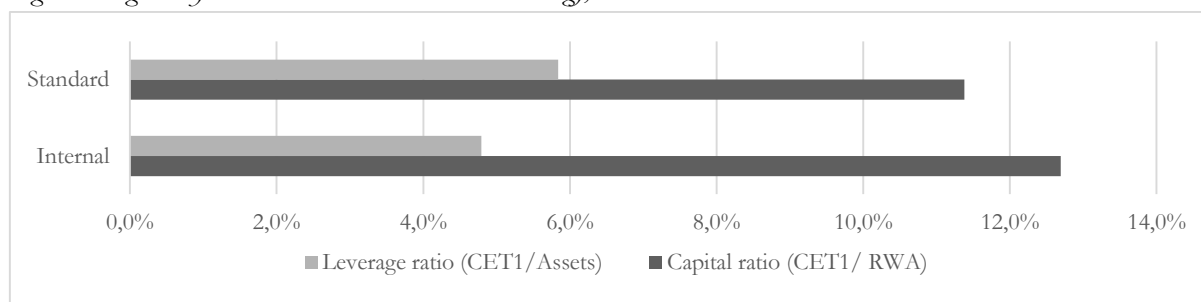


Source: Authors, data from SNL, ECB- EBA.

The risk assessment methodology submitted to the ECB may be developed either by the bank itself, with models estimated internally (so-called “Internal Rating Based” approach) or provided by the regulator (standard approach). In theory, the internal models allow a more accurate estimation of the risks and avoid strategies seeking investment yields from the highest risk assets for a given capital requirement. In practice, the difference between the risk-weighted capital ratio and the non-weighted ratio is significantly higher in the case of the internal rating based model (Figure 2), reflecting, inter alia, greater flexibility, or even gaming, when assessing risks (Le Leslé and Avramova, 2012).

¹⁶ *Systemically Important Financial Institutions.*

Figure 2 Regulatory ratios and risk evaluation methodology, end 2013



Source: Authors, data from SNL, ECB-EBA. Data available only for 82 banks over 130 of AQR. We merged the IRB (« foundation » and « advanced ») and the mixed approaches into the internal approach.

Capital shortfalls report by banks were all computed through their own risk model, meaning that with the same inputs of the economic scenarios, results, as of capital shortfall, that come out this black box are barely comparable.

Section 3. Eurozone banks capital requirements according to regulatory timeline

The most frequently drawn conclusion from the stress test results is that the European banking sector is once again in good health. Almost all French and German banks passed the tests with flying colours: they maintained their risk-weighted ratios above 8% for the baseline scenario and 5.5% for the stressed one. Using data provided by the EBA, we can draw our own assessment of eurozone banks' fragility and capital requirements on a 5 year horizon (2019). We mainly rely on 101 common banks of the ECB and EBA database from 15 countries that represent the majority of banks from the eurozone¹⁷ (see table C in the appendix) and build a recapitalization trajectory from 2014 to 2019 based on regulation implementation plans and potential new evolutions.

3.1. Basel III phase-in and capital constraints

The Basel III agreements, signed in 2010, plan a transitional phase prior to the full and total application of the new requirements comprising an increase of capital ratio and a narrowed definition of capital (see table A in the appendix)¹⁸. Scheduled between 2014 and 2019 this timeline is also incorporated in the CRR/CRD4 legislation.

The transition from Basel II to Basel III is notably characterised by an improved quality of equity (CET1) and an increase in related deductions. More specifically, intangible assets (including “goodwill”) are now 100% deducted from CET1¹⁹. Equity participations in other financial entities are now consolidated to avoid any double counting and, if they exceed 10%, are deducted from CET1. Finally, deferred taxes have been withdrawn from CET1 scope, whereas unrealised profits in the portfolio of assets available for sale have been added (BIS, 2011). The timetable for

¹⁷ This induces the absence of banks from Estonia, Denmark, Lithuania, Poland, Sweden, Slovakia, Norway, Hungary and United-Kingdom. But the total assets of those 101 banks represent €20.4 trillion compare to the €22 trillion of the banks of the CA.

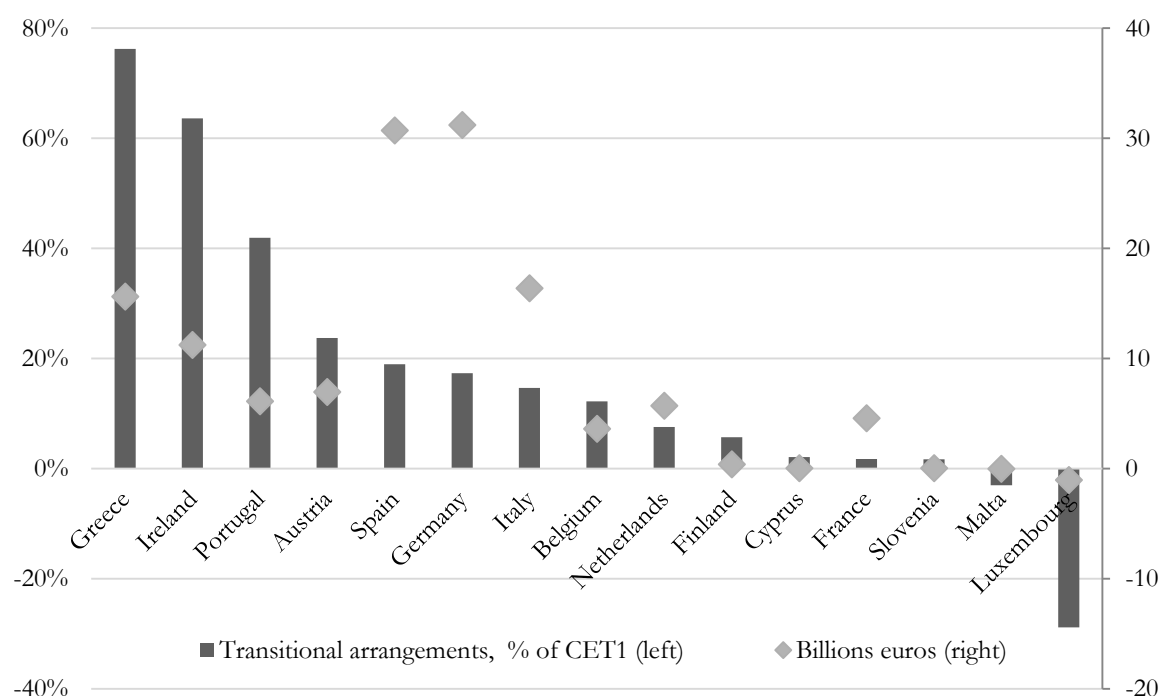
¹⁸ Cecchetti (2015) declared “Putting this all together, we find that if we were to use the Basel III capital and asset definitions, the Basel II requirement of 4 percent would in fact be something between 1/2 percent and 3/4 percent. As the authorities were fond of saying, Basel III increased capital requirements by a factor of 10”

¹⁹ Under Basel II, intangible assets, including goodwill, were deducted at 50% from Tier1 and 50% from Tier2.

application of Basel III in Europe provides for a gradual increase in deductions and the inclusion of the new elements of CET1 (see table A in the appendix). Only the floor level is binding and if States so wish, they can apply final requirements in advance.

National supervisory authorities are not all at the same stage (ECB, 2014). Whereas the majority of States apply floor thresholds (for example 20% in 2014), others have acted in advance, such as Luxembourg, for instance, which already applies a rate close to 100%. Ultimately, banks in various EU countries do not have the same constraints in terms of capital, and the stress test was carried out without seeking to correct these differences. The only harmonisation measure adopted was to refrain from applying facilities granted by national supervisory authorities to their banks, which allow them to, for example, include in their accounts subsidies granted but not yet paid. Although these differences are due to be resolved by 2018, in the interim period, all eurozone banks are not singing from the same hymnal. The lack of harmonisation gives them margins for regulatory arbitrage. The effects of the transitional phase also depend on the composition of the capital held by each bank. The two main items which must be deducted from CET1, as part of the changeover to Basel III, are intangible assets and deferred taxes which can represent a significant proportion of CET1.

Figure 3 Transitional arrangements (deferred taxes and intangible assets) to disappear by 2018, end 2013



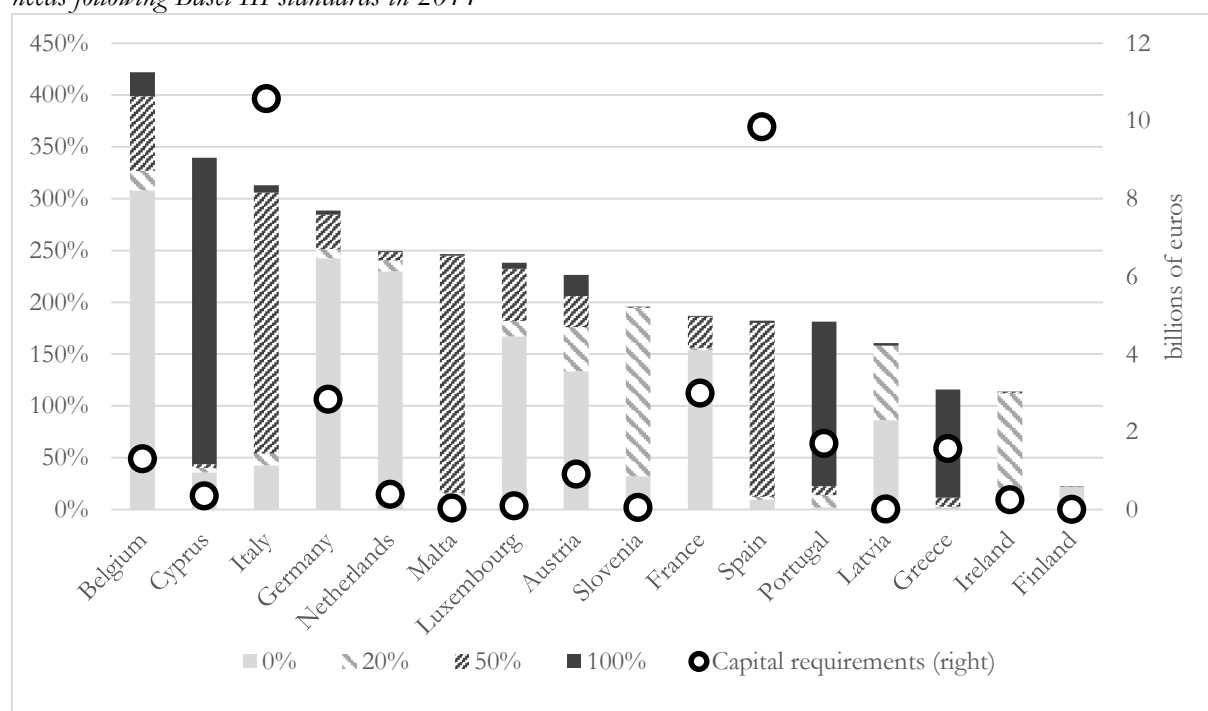
Source: Authors, EBA. The case of Luxembourg and Malta, is due to the new inclusion of unrealized gains in the portfolio of assets, which exceed the assets deducted from CET1.

Transitional arrangement figures are directly available from EBA data. Greece is in the lead with almost 80% of the CET1 of its banks (Figure 3), which will disappear by 2018 due to the end of the phase-in period for transitional arrangements (see table A in the appendix). In addition, German and Spanish banks whose solidity was much boasted about after the stress tests, have the greatest capital requirement, estimated at €30 billion each by 2018. In total, by 2018 the banks must raise more than €130 billion of CET1 (approximately 10% of their CET1 in 2013).

3.2. Sovereign debt treatment

Contrary to the spirit of the Basel regulations (since Basel II), at least for the standard approach²⁰ (BCBS, 2014b) which does not tolerate a nil weighting coefficient except for securities considered risk-free (AAA to AA-), when transposing the Basel committee recommendations into European law²¹, the EU selected a nil coefficient for all sovereign debt securities of European Union countries (Nouy, 2012). Furthermore, the risk-weighting rarely evolves in relation to risk (cf. the recent tensions on sovereign debt). The banks' pattern of holding of assets which consume less capital also allows the reduction of RWAs in relation to total assets. Banks can therefore perform regulatory arbitrage (Figure 4) in favour of highly lucrative sovereign debt securities, notably for peripheral countries, which are not expensive in terms of capital but nonetheless reflect a range of risks. Overall, our calculations show that the exposure of European banks to sovereign debt securities represents 280% of CET1²². We estimated that the application of the Basel III recommended weights would constrain European Union banks to raise €34 billion of capital in 2014²³ (Figure 4).

Figure 4 Eurozone banks' sovereign exposition to other eurozone countries (% of CET1) by risk weights and capital needs following Basel III standards in 2014



Source: Authors, data from SNL, ECB-EBA. Data available for 123 banks from EBA ; countries with sovereign rating, long term in local money, end 2013, between AAA et AA- are weighted at 0%, those between A+ and A- at 20%, those between BBB+ and BBB- at 50% and finally those between BB+ and B- at 100% (Nouy, 2012).

²⁰ The IRB approach allows banks to carry out an internal risk assessment of their exposure or to rely on rating agency scoring. It has been established that the banks use very low coefficients, around 1.4% (Korte and Steffen, 2014), and all the more so as there is no floor on the probability of default on sovereign debt securities contrary to other forms of exposure and they are allowed to switch to the standard approach when assessing sovereign debt securities (partial use).

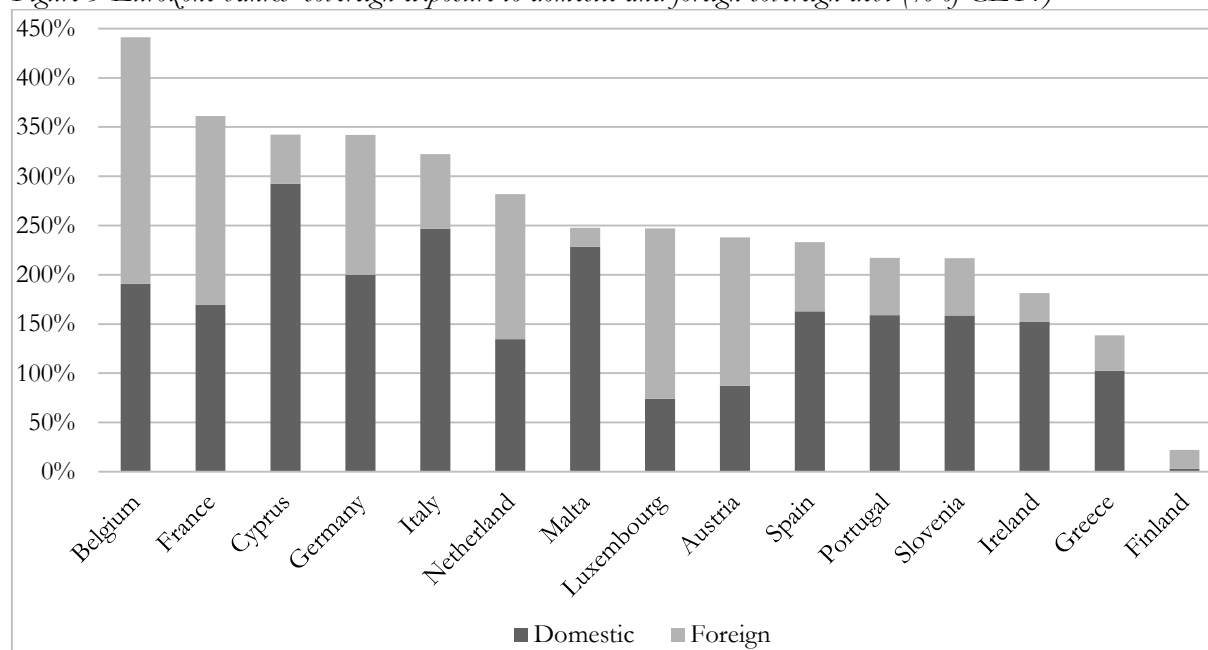
²¹ Capital Requirement Regulation (CRR) and Capital Requirement Directive 4, (CRD4).

²² Exposures are calculated on the basis of data provided by the EBA (EBA, 2014).

²³ Up to €45 billion in capital, of which €29 million of CET1 in 2018 due to the increase of capital ratios (see table A in the appendix)

This arbitrage is manifested as a financing facility for States but can reduce the resources available for the private sector, notably SMEs, which find it difficult to obtain finance on the markets (crowding out effect, Brone et al. 2014). In addition, it favours the significant exposure of banks to domestic or foreign sovereign debt securities (Figure 5).

Figure 5 Eurozone banks' sovereign exposure to domestic and foreign sovereign debt (% of CET1)



Source: Authors, data from SNL, ECB-EBA

Especially banks of the southern countries (Italy, Spain, Portugal, Greece, and Cyprus) are greatly exposed to the domestic debt, making them vulnerable to losses in the event of a debt crisis in those States and potentially compelling their governments to support them, fuelling the vicious circle between banks' balance sheet and domestic bonds' rates. An additional risk is that increased financial integration in Europe will concurrently increase the risk of contagion. Banks from Belgium, Austria or Luxembourg hold a great deal of foreign sovereign bonds.

Although Basel III introduces an incremental risk charge on the trading book which is assumed to take into consideration the risk of default and a change in the rating of trading positions (including sovereign debt), it rather favours the retention of sovereign debt. In recent years, sovereign debt falls within the category of the most liquid "level 1" ²⁴ assets, through the liquidity ratio. Finally, sovereign debts are included in assets which may be held without any cap in the framework of Basel III (BCBS, 2014c). If a limit on holding sovereign debt was set at 25% of capital, more than €1.1 trillion of debt held by European banks would have to change hands (Fitch, 2014).

3.3. The leverage ratio

The risk-weighted capital ratio indicated in 2007-2009 that the major American and European banks were sufficiently capitalised, whereas, several of them failed (Lehman Brothers in 2008) or had to be rescued (Northern Rock in 2007). Studies such as Haldane and Madouros (2012) indicate

²⁴ The assets are ranked into three categories according to the ease of allocating a price, the first level being the most liquid assets, i.e. those which can most easily be priced directly on the market.

that the risk-weighted capital ratio discriminated only marginally between banks in difficulty and more healthy ones. Pagano et al. (2014) indicates that using the leverage ratio, banks had actually very little capital compare to their total of assets. In 2011, for example, Dexia had a risk-weighted capital ratio of 10.4% during the EBA stress test (for a requirement of 5%) whereas its leverage ratio was 1.34%. On the whole, the risk-weighted ratio tends to underestimate risks during the ascending phase of the cycle leading to an artificial increase of the risk-weighted capital ratio.

Although the leverage ratio was not disclosed in the results of the stress tests, it can be calculated on the basis of public data made available by ECB and EBA, using T1 capital and total exposures. The level of capital (T1) is given by EBA for each date of the whole stress-test period, 2014-2016 and for both the baseline and the adverse scenario (EBA, 2014). In addition, we take in account the capital raised by banks during 2014 (see table B in the appendix), using data made available by the ECB (ECB, 2014) and the transitional arrangements as given by the EBA (EBA, 2014). The total assets, as defined by article 429 of CRR for « Leverage Exposure », are provided by the ECB for the end of 2013 (ante-AQR). Since the stress tests are static (see Section 2), we can make the assumption of fixed total assets for the whole test period. The leverage ratio can thus be measured throughout the entire test period for the 101 banks common to the ECB and EBA samples.

We calculate capital shortfall using stressed leverage ratio (*Table 3*), and show that for the 3% threshold of leverage, if capital shortfall are low in 2015²⁵, they are not to be neglected in 2018. This increase is mainly due to the end of transitional arrangements (see Section 3.1) and leads to a shortfall of €67 billion. It is also worth noting that recapitalisation requirements literally explode when the ratio increases from 3% to 4%²⁶. A potential increase of leverage ratio is not an unrealistic hypothesis since the United Kingdom²⁷ and the United States²⁸ have both planned to increase this ratio in comparable proportions during next years, along with Switzerland and the Netherlands, rendering an amendment of this ratio by the Basel Committee quite probable. A study by Steffen and Acharya (2014), using data from the end of 2013 and imposing a leverage requirement of 4%, consider that more than €85 billion would have to be raised by 109 European banks and €373 billion using the systemic risk measure known as the SRISK²⁹ (Brownlees and Engle, 2015).

²⁵ Notice that the leverage ratio came into force only in 2015, see table A in the appendix

²⁶ Haldane (2012) considers that a ratio of at least 7% for systemic entities is required for financial stability. On this issue, 20 renowned economists, including Nobel prize-winners, have expressed a wish to increase the leverage ratio to 15% in an article published in the Financial Times (“Healthy Banking System is the Goal, not Profitable Banks”, November 9, 2010).

²⁷ The basic leverage remains at 3% as provided by Basel III. But, it is supplemented by capital buffers and may increase up to 4.95% in the ascending phase of the economic cycle for systemic banks by 2018 (BoE, 2014b).

²⁸ Leverage ratio increased to 5% for major American banks, and even 6% for those participating in the deposit insurance system (BoE, 2014b). Nevertheless, the European accounting standards (IFRS) are more rigorous than those in the United States (GAAP) (Brei and Gambacorta, 2014) and the American ratio of 6% is equivalent to approximately 4% of the European ratio.

²⁹ This measurement of risk is based on the evolution of the bank’s capital, at the market price, during a period of systemic risk (see OFR, 2012).

Table 3 Capital shortfall in 2015 and 2018 under several stressed leverage thresholds (billions €)

Pays	2015 (as of 1st January)			2018 (as of 1st January) (i)		
	Baseline -3%	Adverse -3%	Adverse -4%	Baseline -3%	Adverse -3%	Adverse -4%
Austria	0	0	-0,3	-0,1	-3,4	-7,4
Belgium	0	-1,0	-3,4	-0,7	-3,4	-8,4
Cyprus	0	0	0	0	0	0
Finland	0	0	0	0	0	-0,7
France	-2,0	-2,1	-32,4	-2,1	-5,6	-56,0
Germany	-0,5	-2,6	-21,6	-2,3	-11,0	-49,2
Greece	0	-0,1	-1,8	-4,1	-15,7	-19,3
Ireland	0	-0,5	-1,0	-3,1	-10,8	-14,0
Italy	0	-3,1	-7,2	0	-8,7	-18,3
Luxembourg	0	0	0	0	0	-0,1
Malta	0	0	0	0	0	0
Netherland	-1,7	-3,1	-17,6	-1,6	-5,1	-24,1
Portugal	0	-0,2	-1,1	0	-2,7	-5,1
Slovenia	0	0	-0,1	0	-0,2	-0,4
Spain	0	-0,4	-1,2	0	-0,6	-10,5
Total	-4,3	-13,1	-87,7	-13,9	-67,2	-213,6

Source: Authors, SNL, data from ECB-EBA. Leverage ratio is based on 101 banks in common on both ECB and EBA samples. It is calculated by dividing the sum of CET1 and additional Tier1 (from the baseline or the adverse scenario), all provided by the EBA, by the total assets as defined by article 429 of CRR for « Leverage Exposure » communicated by ECB, end 2013. We also take in account the additional CET1 and T1 that have been raised in 2014. (i) We use data from 2016 scenarios and we apply on CET1 a complete deduction of transitional arrangements following Basel III phase-in (see table A in the appendix).

Predominantly, some banks of the “core” of Europe (France, Germany and Netherlands) record the greatest discrepancies between the 3% leverage threshold and the 4%, meaning that they are contenting themselves with the legal minimum regulatory capital and their risk-weighted capital ratios. Italian banks, although branded as the black sheep of the Eurozone, are far behind the leading duo of French and German banks. By over-emphasising the risk-weighted capital ratio, the ECB has drawn overly-optimistic conclusions while dismissing a significant proportion of the underlying risks and leaving major banks free to assess risks on their own with wide latitude.

Section 4. Eurozone banks’ ability to meet capital requirements

4.1. Raising capital ratios by deleveraging

In theory, banks can adjust their capital ratio in three ways: 1- they can increase their capital by issuing new securities (shares or hybrid securities) or retaining a larger proportion of their profits; 2- they can adjust the size of their asset (financial securities or loans) or 3- they can reallocate their portfolio in favour of assets that consume less capital (e.g. sovereign debt).

In general, banks prefer the second option so as to avoid issuing new shares or retaining profits, both of which could be detrimental to their shareholders. They favour debt to the detriment of

equity, given the more advantageous tax regime and the implicit government guarantee (Admati and Hellwig, 2013; IMF, 2014). The regulator would prefer the first option in order to avoid a contraction in the financing of the economy. The regulator would also prefer to prevent widespread sales of assets which would - should the banks reduce their debts simultaneously³⁰ - result in a deflationary spiral in the price of assets (Greenlaw et al, 2012). Still, if banks adjust their assets, an economy financed mainly through banking intermediation, as is the case in the eurozone with 74% of credit intermediation provided by the banking system (Goldstein and Véron, 2011), would suffer less from deleveraging through the sale of financial assets than from restricting credit distribution. Another possible solution for fragile institutions would be a merger/acquisition operation. The results of the stress tests will probably bring about a consolidation of the banking system in certain countries such as Italy or Austria, comparable to the one embarked on by Spain since 2010.

In practice, Bologna and co-authors (2014) consider that between the end of 2011 and mid-2013 in Europe, the capital ratio was adjusted by a 9.6% increase in equity capital and a reduction in assets of 4.3% (including a reduction in financial assets other than sovereign debt and derivatives of 18.7% and of credit of 3.8%). However, the authors demonstrate that exposure to sovereign debt securities simultaneously increased by 68%. In the United States, by contrast, the capital ratio increases were achieved almost exclusively by a de facto capital increase (Schoenmaker and Peek, 2014). The Fed in fact demanded that recapitalisation requirements be implemented exclusively via this channel, something that was not stipulated by the EBA during its initial stress tests. The ECB does not have the same powers, but it has recently recommended that failed banks respect regulatory constraints of full Basel III should limit distribution of dividends and bonuses or even refrain from those distributions if they failed the stress-tests.

4.2. The scarcity of equity

Low profitability of eurozone banks

Combining structural weaknesses (e.g. high level of NPL as well as low interest rate environment which puts pressure on net interest margins (BIS, 2015)), evolution of competition (due to further financial integration and the development of e-banking), regulatory reforms and a grim macroeconomic environment raise many uncertainties on the profitability of the European banking sector³¹ and its capacity to build sufficient capital necessary to withstand adverse shocks. The IMF (2012) highlighted that many European banks are modifying their business plans to address several weaknesses exposed by the financial crisis and reduce some activities becoming less profitable and requiring more regulatory buffers, as the selling by Deutsche Bank of its subsidiary Postbank illustrates it. A study by Morgan Stanley and Oliver Wyman³² shows this lower profitability with a durable decline of return on equity (ROE) of investment bank over the last decade from 20% in early 2000's to less than 10% recently. Similarly, an ECB's study (2010) emphasises similar but less marked trend for universal banks.

³⁰ Although a reduction in banking debt may be viable on an individual basis, the global impact could prove disastrous (see the balance sheet recession described by Koo, 2011), hence the advantages of a macro-prudential approach to supervision (Borio et al, 2012).

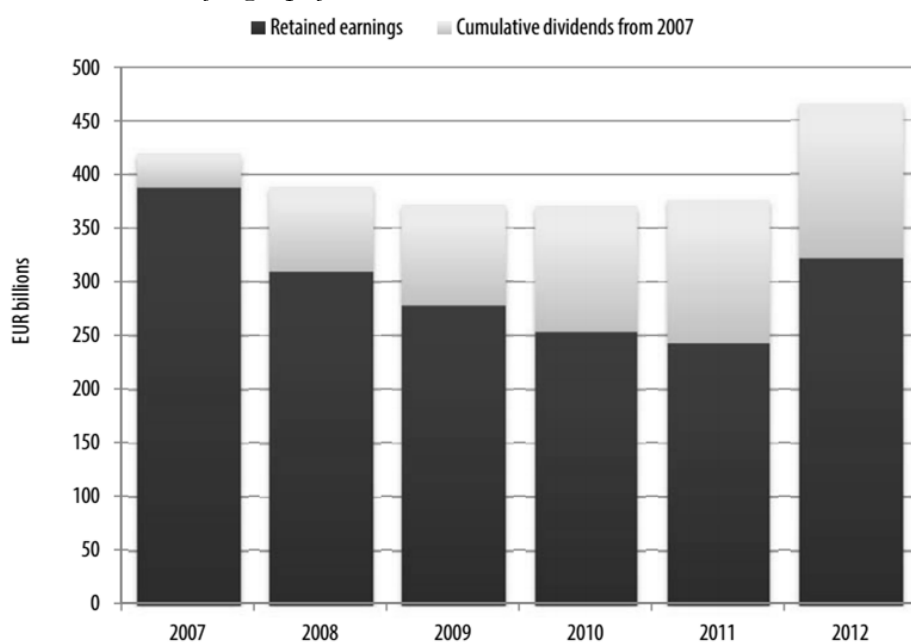
³¹ Speech by Danièle Nouy, Chair of the Supervisory Board of the Single Supervisory Mechanism, at the Economic Council in Berlin, 9 June 2015.

³² Morgan Stanley and Oliver Wyman, March 19, 2015, "Wholesale & Investment Banking Outlook. Liquidity Conundrum: Shifting risks, what it means", Blue paper.

Dividend's distribution

Unlike the Federal Reserve where failed banks are prohibited from distributing profits or buyback shares, the ECB does not have the same powers of coercion. Instead the ECB issued a recommendation that its banks limit dividend distributions. Shin (2015) considers distributing dividend or repurchasing shares as mechanisms whereby banks routinely dissipate their equity. He shows that, from 2007 to 2012, the six-year cumulated dividend distributions of €150 billion, accounted for fully 50% of the retained earnings of a euro area group of banks (Figure 6).

Figure 6 Dividend distribution of a group of 28 euro area banks



Source: Shin (2015). Bankscope, BIS calculations.

Table B in the appendix illustrates the repayment of CET1 and buyback by eurozone banks, per country, estimated at €14.3 billion in 2014 or almost 30% of the CET1 raised in 2014.

Fines

In addition to weak profitability, many banks are facing costly lawsuits linked to misconducts. We can distinguish between direct costs from fines and indirect costs from market valuation since banking stocks with legacy litigation risks have underperformed those without litigation³³ (reputation and risk of hidden misconduct). Banks are facing many legacy litigation liabilities and expenses³⁴. U.S. and European banks have paid out \$190 billion and provisioned about \$60 billion in fines since 2009 for misconduct and further \$72 billion of to be provisioned by 2017 simply from ongoing litigation³⁵. EBA database highlights that, from January to September 2014, eurozone banks incurred fines/litigation costs (net of provisions) of \$7.3 billion (see Table B in the appendix for details per country). The equity banks can raise for incoming capital requirements is getting scarce, jeopardizing eurozone banks' ability to meet capital requirement of the incoming years.

³³ Credit Suisse, Equity Research Europe, 4 June 2014, "Litigation—more risk, less return".

³⁴ Manipulation and violation of rules range from: Libor, Forex, mortgages, insurance mis-selling, money-laundering rules, violating U.S. sanctions and tax evasion.

³⁵ Source: WSJ, 3 June 2015, "How Regulators Can Keep Bankers Honest" and Le Monde, 23 June 2015, "Depuis le début de la crise, les banques ont payé 190 milliards de dollars d'amende" quoting a Morgan Stanley study.

Section 5. Conclusion

The transfer of national diverse euro-area prerogatives to a supra-national institution at the ECB will result in improved comparability, enhanced control, and a level playing field. The work of the ECB on the AQR is a first step in this direction, but much work remains. Certainly, the deadlines imposed, the required human resources, and the absence on the European stage of a credible resolution mechanism sufficiently funded to overcome prospective vulnerabilities may continue to limit the ECB's ambitions in the conduct of the "Comprehensive Assessment". Fortunately, as this is only the first stress test of the new single supervisory body, and hopefully that future ones³⁶ will be more complete. The US experience is instructive and it is regrettable that the ECB did not draw more inspiration therefrom. This exercise is all the more important for the eurozone since its financing structure is based primarily on banking intermediation.

As mentioned by the ECB, this exercise suffers not only from a problem of comparability between banks (different risk models) but also between countries (many discretions applied by national regulators, such for example the definition of non-performing loans). With regard to the risk-weighted capital ratio, the use of the finalised Basel III ratio is to be preferred in order to remove transitional arrangements which renders any comparison between two banks in two different countries almost impossible.

We found that, considering the transitional requirements as of the Basel III transitional phase, eurozone banks still have to raise €130 billion by 2018, in order to keep the same amount of CET1. We further estimated that if sovereign debt capital requirements of Basel III recommendations were applied to eurozone countries, and if eurozone banks wanted to keep the same amount of sovereign debt, they had to raise €45 billion of capital (of which €29 billion of CET1) by 2018. Finally if the 3% threshold for the leverage is quite well observed in the baseline scenario, it leads to capital shortfall in the case of the adverse scenario, especially in the hypothesis of an increase of the threshold to 4%.

Our calculations can be summarised into two scenarios: one with absolute figures of capital shortfall, using Basel III phase-in and corresponding transitional arrangements, and a second with probable scenarios of the evolution of bank regulation in Europe. The latter scenarios include implementation of Basel III capital requirements for eurozone countries sovereign debt (see Section 2.2), increase of the leverage threshold to 4%³⁷ and a macro outcome of adverse scenario for ECB's stress tests. For the first scenario we measure a CET1 shortfall of €130 billion by 2018, and for the second we reach €214 billion of T1 capital (of which €68 billion of CET1). This second scenario figure is not the sum of the 3 sources of recapitalisation we introduced: since we increase the level of capital required (4% for the leverage), the requirements according to portfolio composition (sovereign debt) and the type of capital (transitional arrangements), some requirements offset one another.

³⁶ The next stress test is planned in 2016.

³⁷ It can be achieved through a real increase of the threshold, which we don't consider so credible, or a redenomination of the denominator (Leverage Exposure), which seems more likely.

One thing is certain; reporting of stress tests' result must not gloss over the limitations of this type of exercise. It is dangerous to harbour the illusion of financial security (Borio et al, 2012), and any result slack in efforts to restore banking sector soundness only increase the risk of a future crisis.

Finally, banks succeed generally in meeting risk weighted capital requirement by rising capital, deleveraging, or by rebalancing portfolios towards sovereign debt. However, the low profitability of eurozone banks, their massive dividend distributions (between 30%-50%), their substantial current and prospective fines all give rise to concerns about their ability of eurozone banks to meet the incoming regulatory capital requirements.

Appendix

Table A. Calendar of Basel III implementation (1 January)

%		2014	2015	2016	2017	2018	2019
Capital	CET1	4	4,5	4,5	4,5	4,5	4,5
	Conservation buffer	-	-	0,625	1,25	1,875	2,5
	Countercyclical buffer (i)	-	-	0,625	1,25	1,875	2,5
	Systemic buffer (i)	-	-	0,625	1,25	1,875	2,5
	Total - CET1 (ii)	4	4,5	5,125 - 6,375	5,75 - 8,25	6,375 - 10,125	7 - 12
	Additional Tier1	1,5	1,5	1,5	1,5	1,5	1,5
	Total - Tier1 (ii)	5,5	6	6,625 - 7,875	8,25 - 9,75	7,875 - 11,625	8,5 - 13,5
	T2	1,5	2	2	2	2	2
	Total - Capital (ii)	7	8	8,625 - 9,875	10,25 - 11,75	9,875 - 13,625	10,5 - 15,5
	Leverage (iii)	-	3	3	3	3	3
	Deductions from CET1	20	40	60	80	100	100
Liquidity	LCR	-	60	70	80	90	100
	NSFR	-	-	-	-	Introduction	-

Source: adapted from different documents of Basel committee. (i) Maximum buffer. (ii) Interval between minimum and maximum. (iii) Leverage ratio could be modified during the transition period.

Table B. Capital measures for eurozone banks in 2014 (in million €)

Banks per country	Raising of capital instruments eligible as CET1 capital	Repayment of CET1 capital, buybacks	Conversion to CET1 of hybrid instruments becoming effective (i)	Net issuance of Additional Tier 1 and T2 Instruments with a trigger at or above bank's post stress test CET1 ratio (ii)	Net issuance of Additional Tier 1 and T2 Instrument with a trigger below bank's post stress test CET1 ratio (ii)	Realized fines/litigation costs (net of provisions) (i)
Austria	2 402	-2 758				-4
Belgium	135	-500		90	1 400	-1
Cyprus	2 500		101			
Finland	1 115	-2 704				
France	2 379	-64		3 933	4 080	-5 750
Germany	14 396	-13	65	30	3 449	-1 386
Greece	8 314	-1 690				-25
Ireland						-1
Italy	14 098	-3 294	354			-95
Luxembourg					90	-8
Malta						
Netherlands				3 070	450	
Portugal	2 355	-3 170				
Spain	1 783	-167	2 124		5 692	-27
All eurozone Banks	49 477	-14 360	2 643	7 123	15 161	-7 295

Source: Authors, EBA (2014 EU-wide stress test database, capital measures). (i) From 1 January to 30 September 2014. (ii) In the adverse scenario during the stress test horizon.

Table C. list of 101 banks in common on both ECB and EBA samples

Austria	Spain	Italy
BAWAG P.S.K. Bank für Arbeit	Banco Financiero y de Ahorros	Banca Carige S.P.A.
Erste Group Bank AG	Banco Bilbao Vizcaya Argentaria	Banca Monte dei Paschi di Siena
Österreichische Volksbanke	Banco de Sabadell	Banca Piccolo Credito Valtellinese
Raiffeisen Zentralbank Österreich	Banco Mare Nostrum	Banca Popolare Dell'Emilia Romagna
Raiffeisenlandesbank Niederösterreich	Banco Popular Español	Banca Popolare Di Milano
Raiffeisenlandesbank Oberösterreich	Banco Santander	Banca Popolare di Sondrio
Belgium	Bankinter	Banca Popolare di Vicenza
AXA Bank Europe SA	Caja de Ahorros y M.P. de Zaragoza	Banco Popolare - Società Cooperativa
Belfius Banque SA	Caja de Ahorros y Pensiones de Barcelona	Credito Emiliano S.p.A.
Dexia NV	Cajas Rurales Unidas	Iccrea Holding S.p.A
KBC Group NV	Catalunya Banc	Intesa Sanpaolo S.p.A.
Cyprus	Kutxabank	Mediobanca - Banca di Credito Finanziario
Bank of Cyprus Public Company	Liberbank	UniCredit S.p.A.
Co-operative Central Bank Ltd	NCG Banco	Unione Di Banche Italiane Società Cooperativa
Hellenic Bank Public Company Ltd	Finland	Veneto Banca S.C.P.A.
Germany	OP-Pohjola Group	Luxembourg
Aareal Bank AG	France	Banque et Caisse d'Epargne de l'Etat
Bayerische Landesbank	Banque PSA Finance	Precision Capital S.A.
Commerzbank AG	BNP Paribas	Latvia
DekaBank Deutsche Girozentrale	BPI France	ABLV Bank
Deutsche Apotheker- und Ärztebank eG	C.R.H.	Malta
Deutsche Bank AG	Groupe BPCE	Bank of Valletta plc
DZ Bank AG Deutsche Zentral	Groupe Crédit Agricole	Netherlands
HASPA Finanzholding	Groupe Crédit Mutuel	ABN AMRO Bank N.V.
HSH Nordbank AG	La Banque Postale	Bank Nederlandse Gemeenten N.V.
Hypo Real Estate Holding AG	RCI Banque	Coöperatieve Centrale Raiffeisen
IKB Deutsche Industriebank AG	Société de Financement Local	ING Bank N.V.
KfW IPEX-Bank GmbH	Société Générale	Nederlandse Waterschapsbank N.V.
Landesbank Baden-Württemberg	Greece	SNS Bank N.V.
Landesbank Berlin Holding AG	Alpha Bank	Portugal
Landesbank Hessen-Thüringen	Eurobank Ergasias	Banco BPI
Landeskreditbank Baden	National Bank of Greece	Banco Comercial Português
Landwirtschaftliche Rentenbank	Piraeus Bank	Caixa Geral de Depósitos
Münchener Hypothekenbank eG	Ireland	Slovenia
Norddeutsche Landesbank-Girozentrale	Allied Irish Banks plc	Nova Kreditna Banka Maribor d.d.
NRW.Bank	Permanent tsb plc.	Nova Ljubljanska banka d. d.
Volkswagen Financial Services AG	Company of the Bank of Ireland	SID - Slovenska izvozna in razvojna banka
WGZ Bank AG Westdeutsche		
Wüstenrot Bank AG Pfandbriefbank		
Wüstenrot Bausparkasse AG		

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